

Henrik Kalisch

Department of Mathematics
University of Bergen

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Curriculum Vitae

Education:

Ph.D. in Mathematics, University of Texas, 2001, *B.S. in Mathematics*, Summa Cum Laude and with Highest Honors, University of Georgia, 1996.

Current position:

Professor, **University of Bergen**, since 2008.

Deputy Head of the Department, since 2014.

Previous appointments:

University of Bergen, Norway,

Associate Professor, Department of Mathematics, 2005 - 2008.

NTNU, Trondheim, Norway,

Postdoctoral Fellow, Department of Mathematics, 2004 - 2005.

Lund University, Sweden,

Research Fellow, Centre for Mathematical Sciences, 2002 - 2004.

McMaster University, Ontario, Canada,

Postdoctoral Fellow, Department of Mathematics and Statistics, 2001 - 2002.

Los Alamos National Laboratory, New Mexico, USA,

Intern at the Center for Nonlinear Studies (CNLS), Summer 2001.

Grants:

MegaRoller

Grant from the European Commission (Horizon 2020)

Consortium leader: *AWE Energy*, Finland

Role in project: **Local contact**

EUR 170 000 allocated to the University of Bergen over three years (2018-2020)

Internal Waves in the Marginal Ice Zone, 2018

Hydralab grant from European Commission (Horizon 2020)

Principal investigator: Magda Carr, St. Andrews, Scotland

Role in project: Participant

Norwegian Research Network in Mathematical Models in Geophysical Flows, Image and Signal Processing, Topology and Geometry

Grant from the Research Council of Norway (ISP)

Project number 239033/F20

Role in project: **Project leader**, 2016-2019

NOK 5.000.000 (~ EUR 548 000) over five years (2015-2019)

Nonlinear PDE in Spaces of Analytic Functions

Grant from the Research Council of Norway (FRINATEK)

Project number 213474 / F20

Role in project: **Project leader**

NOK 7.777.000 (~ EUR 850 000) over four years (2012-2015)

Waves in Fluids and Solids

Grant from the Research Council of Norway (FRINAT)

Project number 171267 / V30

Role in project: **Local contact**

NOK 6.890.000 (~ EUR 750 000) over four years (2006-2009)

Supervision of Graduate Students and Research Fellows:

Current Ph.D. students:

Maria Bjørnestad, Olufemi Ige, Anders Norevik.

Current Masters students:

Stevie Cervantes, Hege Frøysa,

Graduated Ph.D. students:

Evgueni Dinvay (2019), Vincent Teyekpiti (2018), Zahra Khorsand (2017), Daulet Moldabayev (2017), Amutha Senthilkumar (2017), Alfatih Ali (2012), Magnar Bjørkavåg (2012), Nguyet Ngyuen, (2010).

Graduated Master's students:

Martin Oen Paulsen (2020), Lisbeth Engell-Sorensen (2019), Sondre Hatland Dahle (2019), Anders Norevik (2019), Dipti Acharya (2018), Krister Trandal (2017), Maria Bjørnestad (2017), Olav Skjølingstad (2016), Mats Brun (2015), Bjørn-Sverre Juliussen (2014), Vincent Teyekpiti (2013), Zahra Khorsand (2012), Amutha Senthilkumar (2012), Erik Eikeland (2010), Lalaniaina Rabenorolahy (2008), Jan Ole Skogestad (2007), Magnar Bjørkavåg (2006).

Departmental and professional service:

Deputy head of the department, since 2014.

Member of faculty board, College of Mathematics and Natural Sciences, since 2019.

Chair of curriculum committee at the Department of Mathematics, 2013-2017.

Member of curriculum committee at the Department of Mathematics, since 2008.

Chair of IT committee at the Department of Mathematics, 2007-2010.

External evaluator for various courses, such as *Partial Differential Equations*, *Numerical Methods*, *Fluid Mechanics*, *Calculus*, and many others at NTNU, Trondheim, and University of Oslo, 2006, 2007, 2008, 2009, 2010, 2011 and 2012.

Organized various sessions at a number of international conferences, including *SIAM Conference on Nonlinear Waves and Coherent Structures*, Cambridge, UK, 2014.

SIAM Conference on Nonlinear Waves and Coherent Structures Rome, Italy, 2008.

IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena, 2005, 2007, 2009, 2011, 2017.

Editorial work:

Editor-in-Chief for *Water Waves*, Birkhäuser, since 2018.

Guest editor for *European Journal of Mechanics B / Fluids*, Elsevier, 2017-2018.

Editor for *Abstract and Applied Analysis*, 2012-2019.

Guest editor for *Nonlinear Processes in Geophysics*, Copernicus, 2012-2013.

Guest editor for *Analysis and Mathematical Physics*, Springer, 2011-2012.

Guest editor for *Mathematics and Computers in Simulation*, Elsevier, 2010-2011.

Organizing of Scientific Conferences:

Main organizer of **Surface Waves in the Ocean**

A conference in honor of Kristian Dysthe on the occasion of his 80th birthday, Bergen, Norway November 30 - December 1, 2017.

Main organizer of **B'Waves 2016**,

A workshop focussed on wave breaking in oceanic and coastal waters.

Bergen, Norway, June 13-17, 2016.

<https://www.uib.no/en/bwaves2016>

Scientific committees:

B'Waves 2018,

IRPHE, Marseilles, France

May 31 - June 1, 2018.

SIAM Conference on Nonlinear Waves and Coherent Structures
Orange County, California, USA
June 11-14, 2018

*The IMACS International Conference:
Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory,*
Athens, Georgia, USA, 2007, 2009, 2011, 2013, 2015, 2017, 2019

Summer School on Multiscale Modeling and Simulation in Science,
Bosön, Stockholm, Sweden June 4-15, 2007.

New Trends in Complex and Harmonic Analysis, Voss, Norway,
May 7-12, 2007.

Member of Ph.D. examination committees:

Andrej Novak (University of Zagreb), 2017; Anupam Pal Choudhury (Tata Institute of Fundamental Research, India), 2015; Alexander Lundevold (University of Bergen), 2012; Odin Gramstad (University of Oslo), 2010; Lauri Ilison (Tallinn University of Technology, Estonia), 2009; Hai Yen Nguyen (Ecole Normale Supérieure de Cachan, France), 2008; Tomas Torsvik (University of Bergen), 2007; Øyvind Kristiansen (University of Oslo), 2006.

Track record:

More than 80 papers in leading international journals, available at
<http://folk.uib.no/hka002/publications.html>

Selected publications:

E. Dinvey, H. Kalisch and E. Parau,
Fully dispersive models for moving loads on ice sheets
Journal of Fluid Mechanics 876 (2019), 122-149.

H. Kalisch and D. Pilod
On the local well-posedness for a full dispersion Boussinesq system with surface tension
Proceedings of the American Mathematical Society 147 (2019), 2545-2559

C. Curtis J.D. Carter and H. Kalisch
Particle paths in nonlinear Schrodinger models in the presence of linear shear currents
Journal of Fluid Mechanics 855 (2018), 322-350

H. Kalisch, D. Mitrović, V. Teyekpiti
Existence and uniqueness of singular solutions for a conservation law in magnetohydrodynamics,
Nonlinearity 31 (2018), 5463

F. Remonato and H. Kalisch:
Numerical bifurcation for the capillary Whitham equation,
Physica D 343 (2017) 51-62

C. Curtis and H. Kalisch
Vortex dynamics in nonlinear free surface flows,
Physics of Fluids 29 (2017) 032101

H. Kalisch, Z. Khorsand, D. Mitsotakis:
Mechanical balance laws for fully nonlinear and weakly dispersive water waves
Physica D 333 (2016) 243-253.

S. Gavriluk, H. Kalisch, Z. Khorsand:
A kinematic conservation law in free surface flow
Nonlinearity 28 (2015), 1805

D. Moldabayev, H. Kalisch, D. Dutykh:
The Whitham equation as a model for surface water waves
Physica D 309 (2015), 99-107

A. Ali, H. Kalisch:
On the formulation of mass, momentum and energy conservation in the KdV equation

Acta Appl. Math. 133 (2014), 113-131

A. Ali, H. Kalisch:

Mechanical balance laws for Boussinesq models of surface water waves

J. Nonlinear Sci. 22 (2012), 371-398

H. Kalisch, D. Mitrović:

Singular solutions of a fully nonlinear 2×2 system of conservation laws

Proc. Edinburgh Math. Soc. 55 (2012), 711-729

M. Bjørkavåg, H. Kalisch:

Wave breaking in Boussinesq models for undular bores

Phys. Lett. A 375 (2011), 1570-1578

M. Ehrnström and H. Kalisch:

Traveling waves for the Whitham equation,

Differential Integral Equations 22 (2009) 1193-1210.

J.L. Bona, Z. Grujić, H. Kalisch:

Global solutions of the derivative Schrödinger equation in an analytic class on a strip

J. Differential Equations 229 (2006), 186-203

H. Kalisch:

Error Analysis of Spectral Projections of the Regularized Benjamin-Ono Equation

BIT 45 (2005), 69-89.

J.L. Bona, Z. Grujić, H. Kalisch:

Algebraic lower bounds for the uniform radius of spatial analyticity for the generalized KdV equation,

Annales de l'Institut Henri Poincaré, Non Linear Analysis 22 (2005) 783-797.

W. Craig, P. Guyenne, H. Kalisch:

Hamiltonian long-wave expansions for free surfaces and interfaces

Comm. Pure Appl. Math. 58 (2005), 1587-1641

J.L. Bona, H. Kalisch:

Singularity formation in the generalized Benjamin-Ono equation,

Discrete Contin. Dyn. Syst. 11 (2004), 27-45.

H. Kalisch:

Stability of Solitary Waves for a Nonlinearly Dispersive Equation,

Discrete Contin. Dyn. Syst. 10 (2004), 709-717.

H. Kalisch:

A Uniqueness Result for Periodic Traveling Waves in Water of Finite Depth,

Nonlinear Analysis 58 (2004), 779-785.

W. Craig, P. Guyenne, H. Kalisch:

A New Model for Large Amplitude Long Internal Waves,

Comptes Rendus Mecanique 332 (2004), 525-530.

Z. Grujić, H. Kalisch:

Local well-posedness of the generalized Korteweg-de Vries equation in spaces of analytic functions,

Differential Integral Equations 15 (2002), 1325-1334.

H. Kalisch, J.L. Bona:

Models for Internal Waves in Deep Water,

Discrete Cont. Dyn. Syst. 6, (2000) 1-20.

Plenary talks:

Wave breaking in undular bores

B'Waves 2018, May 28 - June 1, 2018,

IRPHE, Marseilles, France

Fully dispersive nonlinear model equations for hydroelastic waves

Ice-fluid interaction, October 2-6, 2017,
Newton Institute, Cambridge University, Cambridge, UK

Energy conservation and wave breaking for asymptotic wave models

B'Waves 2014, August 25-29, 2014,
INRIA, Bordeaux, France.

Mechanical Balance Laws for Boussinesq and KdV Equations

Winter school on nonlinear dispersive waves, February 16-21, 2014,
École de Physique, Les Houches, France.

Conservation Equations for Long Wave Models

Nonlinear Dispersive Equations, August 25-27, 2010,
Istanbul Center of Mathematical Sciences, Istanbul, Turkey.

Stability of a CO₂-Seawater Interface

Mathematical Challenges and Modelling of Hydroelasticity, June 21-24, 2010,
International Centre for Mathematical Sciences, Edinburgh, UK.

A Dispersive Model for Hydraulic Jumps

International Conference on Complexity of Nonlinear Waves, October 5-7, 2009,
Institute of Cybernetics, Tallinn University of Technology, Tallinn, Estonia.

Uniqueness Results for Periodic Traveling Waves

Workshop on Free Surface Water Waves, June 14 - 18, 2004,
Fields Institute, Toronto, Canada.

Hamiltonian Long-Wave Models for Free Surfaces and Interfaces

CIM Thematic Term on Mathematics and the Environment, May 3-7 2004.
Department of Mathematics, University of Porto, Portugal.

Well-Posedness of the KdV Equation in Analytic Classes

Öresund Symposium in Partial Differential Equations, May 23-25, 2002,
Lund University, Lund, Sweden.

Mobility (stays one week or longer):

CIRM, Marseille, France, 2018, **National Chung Hsing University (NCHU)**, Dept. of Civil Engineering, Taichung, Taiwan, 2018, **Cambridge University**, UK, 2017, **Banff International Research Station**, Banff, Canada, 2016, **MFO Oberwolfach**, Germany, 2015, **IRPHE**, Marseille, France, 2013, **University of Illinois**, USA, 2013, **University of Notre Dame**, USA, 2013, **Center for Advanced Study**, Oslo, 2008, **University of Virginia**, USA, 2008, **University of Virginia**, USA, 2007, **MFO Oberwolfach**, Germany, 2004.

Fellowships:

Simons Fellowship, University of Cambridge, 2017.

Meltzerfondet, travel grant, University of Bergen, 2012.

The Royal Swedish Physiographic Society, travel grant, Lund University, 2003.

Bökelunds Trust, travel grant, Lund University, 2003.

Lefevre Departmental Fellowship, University of Texas, Fall 2000.

University Continuing Tuition Fellowship, University of Texas, 1999-2001.

Strahan Award for Outstanding Junior in Mathematics, University of Georgia, 1994.